Docket No. W-354-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of Keene et al.		)	
		)	Group Art Unit: 3679
		)	
Serial Number	10/597,829	)	Examiner: A. Dunwoody
		)	
Filed	August 9, 2006	)	Docket No: W-354-02

For: Self Setting High Pressure Fitting

APPLICANT'S APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Applicant of the above-identified U.S. patent application submits this Appeal Brief in response to the Office Action dated December 16, 2008 and in support of an appeal from the final rejection of claims 1-10 in this application.

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1. REAL PARTY OF INTEREST

The real party of interest in the above-identified patent application is Waters Investments Limited, the assignee of record, Waters Technologies Corporation and Waters Corporation. Waters Corporation is a publicly held corporation. Waters Technologies Corporation is a wholly owned subsidiary of Waters Corporation. Waters Investments Limited was a wholly owned subsidiary of Waters Technologies Corporation but has been merged with such Waters Technologies Corporation. The assignment from the inventor to Waters Investments Limited is recorded at reel/frame 020809/0992. The assignment from Waters Investments Limited to Waters Technologies Corporation is recorded at reel/frame 0022837/0404.

2. Related Appeals and Interferences

At the time of the filing of the Appeal Brief, Applicant was unaware of any related appeals or interferences that would directly affect, be directly affected by or have a bearing on the decision in this case.

3. Status of Claims

The Application originally presented claims 1-10 for examination. The Examiner made no restriction requirements. Claims 1-10 were rejected in a first office action of April 9, 2008. Applicant filed a response to the first non-final office action but did not seek to amend any claims. The Office issued a final rejection dated December 16, 2008. Applicant did not file a further response or amendment and filed the present appeal. This Appeal is directed to claims 1-10. Claims 1 and 10 are independent claims.

4. Status of Amendments

The Application originally presented claims 1-10 for examination. Applicant did not seek to amend any claims during prosecution. This Appeal is directed to claims 1-10. Claims 1 and 10 are independent claims. The Claims as filed and to which the present appeal is made are presented in the Claims Appendix.

5. SUMMARY OF THE CLAIMED SUBJECT MATTER

As defined by Claim 1, Appellants' invention relates to a coupling element. Coupling elements may be used as high pressure seals within high pressure systems in analytical laboratories, for example, in the isolation and characterization of a particular compound of interest. High pressure analytical instruments tend to provide better separation of a compound of interest, and so the demand for these instruments is increasing. The demand for coupling elements suitable for use with these instruments is also therefore increasing. The applicants have invented an improved coupling element that performs better at the high pressures required within these analytical apparatus.

Specifically, referring to figure 1, the claimed invention relates to a coupling element (1). The coupling element (1) comprising a male sealing element (5) having a first end (7) and a second end (9) and a longitudinal axis extending between said first end and said second end. The male sealing element has a generally cylindrical shape, wherein the male sealing element defines a fluid passageway therethrough for the transmission of fluid. The male sealing element is slideably coupled to a ferrule (13). The first end defines a conical sealing surface (17). The conical sealing surface has a mismatched angle to a female sealing element (23) which defines a complementary conical geometry. A biasing element (19) disposed between a retaining ring and the ferrule for biasing the first end into direct abutting contact with the female sealing element with a biasing force sufficient to form a fluid-tight seal between the first end and the female sealing element as described on page 4 line 29 to page 5 line 14 of the specification.

Claim 2 recites that the mismatched angle ranges from about 1 to about 2 degrees as described on page 7 line 31 to page 8 line 7 of the specification.

In accordance with claim 3, the male sealing element forms a metal to metal fluid-tight seal when mated with a female sealing element as described on page 4 line 29 to page 5 line 14 of the specification.

Claim 4 specifies that the male sealing element's first end deforms when mated with said female sealing element as described on page 7 lines 26-30 of the specification.

Claim 5 recites that the male sealing element is centrally positioned when mated with said female sealing element as described on page 7 lines 16-24 of the specification.

In accordance with claim 6 the biasing element comprises a compression spring. Claim 7 specifies that the compression spring is a Belleville spring as described on page 6 line 26 to page 7 line 3 of the specification.

Claim 8 recites that the male sealing element comprises metal. Claim 9 specifies that this metal is stainless steel as described on page 5 lines 21-31 of the specification.

As defined in claim 10, the applicants invention also relates to a method for forming a fluid-tight, high pressure seal which tracks the language of Claim 1, comprising providing a male sealing element (5) having a first end (7), second end (9), and a longitudinal axis extending between the first end and the second end, wherein the male sealing element has a generally cylindrical shape, wherein the male sealing element defines a fluid passageway therethrough for the transmission of fluid, wherein the male sealing element is slideably coupled to a ferrule (13), wherein the first end defines a conical sealing surface (17), wherein the conical sealing surface has a mismatched angle to a female sealing element (23), wherein the female sealing element defines a complementary conical

geometry, and a biasing element (19) disposed between a retaining ring and the ferrule for biasing the first end into direct abutting contact with the female sealing element with a biasing force sufficient to form a fluid-tight seal between the first end and the female sealing element and applying a compression force in an axial direction of the male sealing element toward the female sealing element sufficient to form a fluid-tight, high pressure seal as described in on page 4 line 29 to page 5 line 14 of the specification

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,102,449 to Welsh (Welsh) in view of U.S. Patent 5,848,813 to Albrecht (Albrecht). This Appeal raises one issue, as set forth below:

1. Whether the inventions of claims 1-10 are unpatentable under 35 U.S.C. § 103(a) over Welsh in view of Albrecht (Issue 1).

7. ARGUMENTS

The inventions of claims 1-10 are patentable over Welsh in view of Albrecht (Issue 1).

Claims 1-10 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 6,102,449 to Welsh (Welsh) in view of U.S. Patent 5,848,813 to Albrecht (Albrecht). This section of the Patent Law provides (in pertinent part) that "a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 ..., if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains". KSR v. Teleflex, 550 U.S. 398 (2007) upheld Graham v. Deere, 383 U.S. 1 (1966) which held that determination of obviousness required findings as to the scope and content of the prior art, the differences between the claimed invention and the prior art and the level of skill in the prior art.

Generally, to show a *prima facie* case of obviousness under 35 U.S.C. §103: 1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings: 2) there must be a reasonable expectation of success; and 3) the prior art reference(s) must teach or suggest all of the claim limitations. See M.P.E.P. 2143. Furthermore, a proper rejection under 35 U.S.C. §103 cannot be based on hindsight knowledge of the invention under consideration for the sole basis of attempting to meet the recitations in the claims. Environmental Design Ltd. V. Union Oil Co. of Cal, 218 U.S.P.Q. 865, 870 (1983); see also KSR, supra.

The Examiner contends that Welsh discloses a coupling element

comprising a male sealing element having a first end, second end and a longitudinal axis extending between the first end and the second end. The Examiner further contends that Welsh discloses a male sealing element having a generally cylindrical shape defining a fluid passageway therethrough. The Examiner further contends that the male sealing element is slidably coupled to a ferrule (160) and the first end defines a conical sealing surface, wherein a female sealing element (132) defines a complementary conical geometry. The Examiner continues, Welsh discloses a biasing element (154) disposed between a retaining ring (170) and the ferrule for biasing the first end into direct abutting contact with the female sealing element with a biasing force sufficient to form a fluid-tight seal between the first end and the female sealing element.

The Examiner acknowledges that Welsh does not teach or disclose the conical sealing surface having a mismatched angle to the female sealing element. However, the Examiner contends such a mismatched angle is taught by Albrecht.

Albrecht discloses a threaded port for fluid flow connection with pipes and large scale tubes. Albrecht discloses a flow threaded port that can be used with the standard 37° male tube fitting to form a superior connection for high pressures (lines 58-61 of column 1). However, the workings of a threaded port for fluid connection are considerably different form the workings of the port of the present invention. Specifically, referring to figure 3, a fluid flow connection (10) comprises a female portion including a threaded port (12) and a male portion including a standard connector (14). The female portion (12) of connection (10) includes a port body (16) having a threaded bore (18) extending inwardly from an end face (17) to form an internally threaded female engaging portion (18).

The Examiner contends that since Welsh and Albrecht are concerned with tapered sealing surfaces it would be obvious to one of ordinary skill to fabricate a conical sealing element with a mismatched angle to the female sealing element.

Applicant respectfully submits that the Examiner's characterization of the Welsh disclosure is in error or misleading. The characterization of the teaching of the Welsh reference shifts components and elements from one part to the other in order to argue obviousness. This shifting, attempting to make the reference fit, where it otherwise doesn't, is itself an indication of inventiveness. And, the application of the Albrecht reference adds little to the rejection after the true nature of the parts and components of Welsh are known and understood.

Embodiments of the present invention have little in common with the devices of Welsh. Contrasting Figure 1 of the present Application to Figure 2 of Welsh, whereas the device of the present application presents six parts, seven if one counts the female sealing element, Welsh presents at least eleven parts. The parts of Welsh present different structures, operate in a different manner to achieve a different result.

The present invention has a male sealing element 9, having a first end having a conical sealing element 17. This conical sealing element 17 at the first end of male sealing element 9 is received against the female sealing element.

Welsh does not have a male sealing element as defined in claim 1. Welsh discloses a capillary 10. The capillary 10 does not have a first end for sealing to a female sealing element. The capillary 10 of Welsh must have an annular seal 160 fitted to a nose cone 118 to effect sealing engagement with the female opening to which it is fitted. The Examiner's rejection suggests that at least one of the annular seal 160 or the nose cone 118 is a ferrule. However, Welsh does not refer to the nose cone 118 as a ferrule and the nose cone does not appear to

function as a ferrule. If the nose cone 118 was, indeed, a ferrule, the nose cone 118 would have no need for annular seal 160.

Welsh is well aware of ferrules and teaches the use of a ferrule 114 in a different context. The nose cone 118 is not a ferrule.

Thus, Welsh does not disclose a male sealing element with a first end for sealing engagement to a female sealing element. Welsh secures and seals the capillary with an annular seal, not with the terminal end of the capillary.

The Examiner argues that the "male sealing element is slideably coupled to a ferrule (160) wherein said first end defines a conical sealing surface". However, if the words "first end" is in reference to the capillary 10, a careful review of the Specification reveals no conical sealing surface associated with the capillary and none is depicted in the Figures. If the conical sealing surface to which the Examiner refers to is associated with the "ferrule", such surface is not associated with the correct analogous element. And, the "ferrule" of Welsh to which the Examiner refers is not a ferrule but a nose cone. The sealing surface, annular seal 160, of Welsh is annular not axial as described in the present claims.

The Examiner argues, Welsh discloses "a biasing element (154) disposed between a retaining ring (170) and the ferrule for biasing the first end into direct abutting contact with the female sealing element with a biasing force sufficient to form a fluid-tight seal between the first end and the female sealing element". The Examiner's argument in this regard is contrary to the express disclosure of Welsh.

Welsh describes his device as having an "annular seal biased by a biasing system so as to realize a fluid-tight seal between the receiver port surface and

the aft portion of the annular projection." See: Welsh at column 5 lines 16 – 18. Therefore, Welsh does not disclose as the Examiner contends, "biasing the first end of the male sealing member into direct abutting contact with the female sealing element ... to form a fluid-tight seal." The biasing of Welsh is directed to a different structure, acting in a different manner, creating an annular sealing force, to achieve a different result, sealing removed from first end of the capillary.

Clearly, Welsh does not disclose the conical sealing surfaces having a mismatched angle to the female sealing element. The Examiner acknowledges as much. Welsh does not effect sealing with the capillary against a female sealing surface. Welsh does not have a male sealing member in the sense of the present invention. Welsh does not bias the same elements or bias analogous elements.

If Welsh does not bias the same elements or analogous elements, where is the motivation to combine Albrecht? The Examiner contends that the motivation to combine references is that Welch and Albrecht are "concerned with tapered sealing surfaces".

Welsh does not seem to effect sealing with the cone member 118. Welsh uses the annular seal 160 to effect sealing. Therefore, this common concern, "tapered sealing surfaces", does not exist. Mismatched angles would seem to have little relevance to the annular seal 160 and its corresponding surfaces. The Examiner has not suggested any rationale for Welsh to change from an annular seal to mismatched sealing surfaces.

The references, Welsh and Albrecht are not only traveling in different directions, they are not on the same road. Welsh is teaching separate and distinct annular seals and Albrecht is teaching mismatched angles. Welsh has no need for mismatched angles with an annular seal.

Indeed, the different "roads" of the present invention and Albrecht is clear. Applicants further submit that the type of fitting shown by Albrecht would not be suitable for the purpose of the present invention due to the differences in the scale. In the present invention, the male element may have a diameter ranging from approximately 0.031" to about 0.094". Albrecht discloses pipes having sizes starting at ½ an inch. Applicants respectfully submit that the different scale would have serious implications on the practicality of the Albrecht threaded port. Screw threads would not be of practical use in the apparatus of the present invention nor would such a direct coupler 14, as depicted in Figure 4 of Albrecht, have any purpose in the context of Welsh. Therefore, Applicant submits that the person skilled in the art would not refer to the Albrecht application in order to overcome the problems of Welsh.

The two applied references are not "concerned with tapered sealing surfaces", as argued by the Examiner. Welsh is concerned with connectors for capillaries which connectors feature the annular seal 160 to effect sealing. Albrecht is concerned with a pipe fitting which pipe fitting is threaded and is received in a threaded port.

The Examiner seems to recognize a difference between pipe fittings and capillary scale fittings. However, the Examiner argues that Albrecht is "reasonably pertinent to the particular problem, that problem is "tapered sealing surfaces". Applicant respectfully submits that the common problem identified by the Examiner is not a problem at all. It is a potential solution, a solution which Welch seems to teach away from. A solution which is implemented by Albrecht is a manner far removed from the present invention. The only commonality is the Examiner's needs to make a rejection, in which case all prior art concerns "tapered sealing surfaces".

However, such is the nature of a rejection based on hindsight.

Applicant respectfully submit the skilled person upon reading Welch in view of the Albrecht application at the time the present invention was made, would not combine the teachings to produce the present invention.

Applicant respectfully submits the inventions of the present Application as set forth in the claims are not obvious in view of the Welsh and Albrecht. The references of record do not teach, disclose or suggest a male sealing element 9, having a first end having a conical sealing element 17. This conical sealing element 17 at the first end of male sealing element 9 is received against the female sealing element at a mismatched angle.

Conclusion

In view of the arguments presented herein, Applicant respectfully requests this Board reverse the findings of obviousness. Applicant respectfully requests that all claims proceed to allowance. In the event the Board desires further clarification or refinement of the claims, Applicant stand ready to amend the claims in response to the Board's suggestion.

Respectfully submitted,

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Claims Appendix

1. A coupling element, comprising:

a male sealing element having a first end, second end, and a longitudinal axis extending between said first end and said second end, wherein said male sealing element has a generally cylindrical shape, wherein said male sealing element defines a fluid passageway therethrough for the transmission of fluid, wherein said male sealing element is slideably coupled to a ferrule, wherein said first end defines a conical sealing surface, wherein said conical sealing surface has a mismatched angle to a female sealing element, wherein said female sealing element defines a complementary conical geometry; and

a biasing element disposed between a retaining ring and said ferrule for biasing said first end into direct abutting contact with said female sealing element with a biasing force sufficient to form a fluid-tight seal between said first end and said female sealing element.

2. The coupling element of claim 1, wherein said mismatched angle ranges from about 1 to about 2 degrees.

3. The coupling element of claim 1, wherein said male sealing element forms a metal to metal fluid-tight seal when mated with a female sealing element.

4. The coupling element of claim 3, wherein said male sealing element's first end deforms when mated with said female sealing element.

5. The coupling element of claim 3, wherein said male sealing element is centrally positioned when mated with said female sealing element.

6. The coupling element of claim 1, wherein said biasing element comprises a compression spring.

7. The coupling element of claim 6, wherein said compression spring is a Belleville spring.

8. The coupling element of claim 1, wherein said male sealing element comprises metal.

9. The coupling element of claim 8, wherein said metal is stainless steel.

10. A method for forming a fluid-tight, high pressure, comprising:

providing a male sealing element having a first end, second end, and a longitudinal axis extending between said first end and said second end, wherein said male sealing element has a generally cylindrical shape, wherein said male sealing element defines a fluid passageway therethrough for the transmission of fluid, wherein said male sealing element is slideably coupled to a ferrule, wherein said first end defines a conical sealing surface, wherein said conical sealing surface has a mismatched angle to a female sealing element, wherein said female sealing element defines a complementary conical geometry, and a biasing element disposed between a retaining ring and said ferrule for biasing said first end into direct abutting contact with said female sealing element with a biasing force sufficient to form a fluid-tight seal between said first end and said female sealing element; and

applying a compression force in an axial direction of the male sealing element toward said female sealing element sufficient to form a fluid-tight, high pressure seal.

Evidence Appendix

None.

Related Proceedings Appendix

None